

Agassiz and Tanner are superior by reason of their better apparatus to any heretofore made, and they seem to show that with the exception of a superficial zone of a few hundred fathoms and a thin zone immediately over the bottom, the animal kingdom is represented in the intervening region by the dead bodies of sinking animals only, and has no peculiar fauna of its own and but little life. There is no obvious reason why this must be so, but the most carefully checked observations yet made indicate that it is so. Apart from this one point, the paper of Hæckel gives a most interesting, accurate and vivid idea of the pelagic life of the sea, and one which every one may read with profit. The vast experience in surface and coast collecting which the Jena Professor has had, enables him to speak from experience in this direction, and the material obtained by others, on the Challenger and elsewhere, which he has worked up, has given him great familiarity with the Plankton fauna.

W. H. D.

CONTRIBUTIONS TOWARD A REVISION OF THE TASMANIAN LAND
MOLLUSCA.

BY H. SUTER.

Since I wrote the "Preliminary Notes on Tasmanian Land Shells," I have sacrificed many more specimens of my collection for the study of the dentition, and, as I have just finished the work, I wish to give here the result of my investigations.

Before giving the results of my study, it will be necessary to say a few words on the classification of the New Zealand Helicidæ. Mr. H. A. Pilsbry proposed (NAUTILUS, VI, 1892, No. 5, pp. 54-57) a new classification of N. Z. Helicidæ, the main feature of it being the forming of one genus, *Gerontia*, of these former genera constituting my family *Phenacohelicidæ*. Later on he published (Proc. Acad. Nat. Sci. Philada., 1892, pp. 387, etc.) a "Preliminary Outline of a New Classification of the Helices," in which he included under the one genus *Endodonta*, the following groups: *Endodonta* s. str., *Ptychodon* (= *Maoriana*), *Charopa*, and his genus *Gerontia*. I can not agree with this latter classification, as the author was under the impression that *Endodonta*, *Charopa*, etc., possess a muc-

ous tail gland, which is not the case. Moreover, the jaw in *Endodonta* and *Charopa* is only striated, whilst stegognath in *Gerontia*, and the radula in the latter is more or less distinctly pseudozonitoid. I am of opinion that the separation of *Gerontia* from *Endodonta* is fully justified; the patuloid shells being included in *Endodonta*, whilst the more zonitoid forms are embraced in *Gerontia*.

Mr. Charles Hedley and the writer substituted von Martens' *Flammulina* for *Amphidoxa* of N. Z. authors, and as the genus of von Martens dates from 1873, it must be used as the generic name instead of *Gerontia* (1883).

The classification of the New Zealand Helicidæ I propose, following chiefly Mr. H. A. Pilsbry, is the following:

Group HAPLOGONA Pilsbry.

1. Genus *Flammulina* (von Martens) Suter.

Sections: (1) *Flammulina* v. Mart. s. str.; (2) *Gerontia* Hutt.; (3) *Phacussa* Hutt.; (4) *Therasia* Hutt.; (5) *Pyrrha* Hutt.; (6) *Phenacohelix* Sut.; (7) *Allodiscus* Pils.; (8) *Suteria* Pils.; (9) *Thalassohelix* Pils.

2. Genus *Endodonta* (Albers) Pilsbry.

Sections: (1) *Endodonta* Albers, s. str.; subsect. *Ptychodon* Ancy; (2) *Charopa* Albers; subsections, a. *Tesseraria* Bottger; b. *Aeschrodomus* Pils.

Group POLYPLACOGNATHIA Pilsbry.

Genus *Luoma* (Gray) Pilsbry.

Sections: (1) *Luoma* Gray, s. str.; (2) *Phrixgnathus* Hutton.

Giving now the classification of the Tasmanian land shells examined, I wish to point out that it is based on the dentition as well as on the shell characters; their number is thirty-two.

Genus *Flammulina* (von Mart.) Suter.

Sect. *Flammulina* von Martens, s. str.

- (1) *F. jaungermanniae* Petterd. (3) *F. luckmani* Brazier.
 (2) *F. sitiens* Cox.

Sect. *Gerontia* Hutton.

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| (1) <i>G. albanensis</i> Cox. | (7) <i>G. tasmaniae</i> Cox. |
| (2) <i>G. stanleyensis</i> Petterd. | (8) <i>G. subrugosa</i> Brazier. |
| (3) <i>G. legrandi</i> Cox. | (9) <i>G. mathiunæ</i> Petterd. |
| (4) <i>G. marchiannæ</i> Cox. | (10) <i>G. macdonaldi</i> Cox. |
| (5) <i>G. diemenensis</i> Cox. | (11) <i>G. bassi</i> Brazier. |
| (6) <i>G. gadensis</i> Cox. | (12) <i>G. tamarensis</i> Petterd. |

Sect. *Phacussa* Hutton.

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| (1) <i>Ph. savesi</i> Petterd. | (3) <i>Ph. Hamiltoni</i> Cox. |
| (2) <i>Ph. stephensi</i> Cox. | |

Sect. *Allodiscus* Pilsbry.

- (1) *A. limula* Cox.

Sect. *Thalassohelix* Pilsbry.

- (1) *Th. fordeii* Brazier.

Genus *Endodonta* (Albers) Pilsbry.Sect. *Charopa* Albers.

- (1) *Ch. antialba* Beddome.

Genus *Laoma* (Gray) Pilsbry.Sect. *Phrixgnathus* Hutton.

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| (1) <i>Ph. weldii</i> Tenison-Wood. | (5) <i>Ph. pictilis</i> Tate. |
| (2) <i>Ph. caesus</i> Cox. | (6) <i>Ph. pipænsis</i> Petterd. |
| (3) <i>Ph. henryana</i> Petterd. | (7) <i>Ph. halli</i> Cox. |
| (4) <i>Ph. furneauxensis</i> Petterd. | (8) <i>Ph. hobarti</i> Cox. |

Genus *Rhytida* Albers.

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| (1) <i>R. sinclairi</i> Pfeiffer. | (2) <i>R. ruga</i> Cox. |
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Genus *Rhenea* Hutton.

- (1) *R. nelsonensis* Brazier.

It is a most astonishing fact how close the relation between the Tasmanian and New Zealand molluscan fauna really is, more so than I ever expected it to be. Of nine sections of the genus *Flam-*

mulina occurring in New Zealand, five are represented in Tasmania. Most remarkable is the preponderance of *Gerontia*, a section represented in New Zealand by two species only, and of *Phrixognathus*, which is also well represented in New Zealand. A very striking feature is the almost total absence of *Endodonta*, there being one species of *Endodonta* s. str. (*E. dispar* Braz.) and one of *Charopa* known from Tasmania. *Rhytida* is more abundant in Tasmania, whilst *Rhenea* is represented by two species in each country.

There can be no doubt about the great antiquity of these forms, as they must date at least from the Cretaceous period.

New Zealand. Christchurch, October 4, 1893.

IN MEMORIAM—ROBERT WALTON.

It is with sad hearts that we record the death of our young friend Robert Walton. While out collecting on Saturday, November 11, along the steep bank at West Conshohocken, he slipped and fell as a freight train was passing below, receiving a terrible gash on the head and having one of his legs crushed beneath the wheels, from which he died at 8 p. m., the accident occurring about noon. He was born in Halifax, England, July 17, 1875, and came to this country in the summer of 1889. He was a collector from boyhood, studying nature with that enthusiasm which only a born naturalist can. He was not content with a collection of shells alone; his was a collection of the mollusca. He studied their anatomy, working out their jaws and dentition, the darts from the *Zonites*, and the testaceous shell-plates, from the *Limaces*. He was a close observer, and by his zealous collecting he found many forms not before recorded from this section. Among his rarities were reversed specimens of *Zonites cellarius* and *Zonites ligerus*, and I remember his saying, when we met only a few days before his sad accident, that he found the reversed *Zonites cellarius* at West Conshohocken. He was to be appointed as a Jessup student at the Academy of Natural Sciences, and was looking forward, as only a young heart can, to the day when he would be studying and working there among the objects he so dearly loved. Mr. Pilsbry was looking forward with a great deal of pleasure to the time when he would have such a valuable